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bles can be conveniently read for committing to memory without haste or delay. Dr. Schumann observed: (1) That when the drum was going too rapidly and he set the rate to reduce it to the normal speed, this latter then seemed too slow; (2) that if the subjects were mentally tired the normal speed seemed unusually fast, while if they were fresh it seemed slower than usual. They are both due to the carrying over of mental impressions to changed conditions; when the drum is going a little too fast it takes a greater strain of the attention to follow the syllables; a lessening of this strain seems by contrast to reduce the speed more than it really does. So when tired we interpret difficulty of keeping the attention as increase of speed of impressions. So in time experiments in passing from one normal interval to a longer the second seems unusually long, and vice versa; we seem to have a time (.7 seconds) in which impressions are conveniently attended to. When they come more rapidly we have to strain the attention to follow them; when more slowly we have to wait for them. A similar fact was observed in the motor field. If one hand moves over a normal space of 20 cm. and the other hand moves over a space of 17, 18, 19, 20, 21, 22, or 23 cm., to judge which is longer, then in moving over a space of 23 cm. the hand will frequently move rapidly the first 20 cm. and then slowly, the space moved over seeming unusually long. Here a certain motor innervation is ready and if exceeded makes the space seem unusually long. More extended observations are in progress.

*Zur Lehre von der Willensfähigkeit.* J. ORSCHANSKY. Archiv für Anat. u. Phys. 1889. Phys. Abth., 3-4, p. 173.

What is the nature of the difference between the two distinct kinds of exercise of the will,—the act of impulse and the act of inhibition? Is the one a setting free of energy, the other a storing of it up (Wundt)? Do they take place in different parts of the nervous system (Sietschenow)? Is it a case of simple interference of waves (Cyon)? Do these waves proceed in different directions (Goltz)? Does the struggle between the two take place in the nerve-center, the nerve or the muscle; or is the suppression of the action of one set of muscles brought about by the action of the antagonistic set (Munk)? This latter view seems plainly untenable on account of the fact that some muscles, as those in the region of the N. faciales, have no antagonists. The experiments of Orschansky were performed on the M. masseter on account of its being among the autonomous muscles, strong, of constant attachment, and admitting of easy registration of its action. They seem to show that the reaction-time of inhibition does not differ, after a brief period of practice, from that of the direct impulse. But the reaction-time of the impulse consists of four moments: (1) The passage to the sensory center, (2) the sense-perception, (3) the act of will, (4) the motor impulse; and it would be very improbable that the reaction-time of the inhibition should be wanting in any of these stages and should still be of the same duration. Moreover, very different reaction-times were obtained by varying, separately, the tension and the amplitude of the muscular excursion, and in every case the change in the inhibition-time follows closely upon the change in the impulse-time. (The author's explanation of the seemingly anomalous effects produced by these two moments does not seem to be very clear.) The effect of pathological conditions is also the same upon both. From this it seems natural to conclude that the anatomical circuit is the same for both species of exercise of the will.

C. L. F.

*Untersuchungen über die Empfindlichkeit des Intervallsinnes.* IWAN SCHISCHMÁNOW. Philosophische Studien. Bd. V., H. 4.

Schischmánow subjects the entire problem of the sensibility to intervals of tone to a thorough and independent re-investigation. He pre-